

REMARKS/ARGUMENTS

Claims 1-4, 6, 8-12, and 16 are pending, of which claims 8-12 are withdrawn. Claims 5, 7, and 13-15 have been canceled without prejudice. Claims 1, 3, and 6 have been amended. New claim 16 has been added. No new matter has been introduced. Applicants believe the claims comply with 35 U.S.C. § 112.

Claims 1-4 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Choi (US2001/0035920).

Applicants respectfully submit that independent claim 1 as amended is novel and patentable over Choi because, for instance, Choi does not teach or suggest detecting a shorting defect between a scan line and signal line disposed with an interlayer insulation film therebetween and identifying the location of the shorting defect; forming an organic insulating layer to cover the intersectional region with a shorting defect locally; and cutting the branch at two regions as to sandwich the shorting defect using a laser beam before curing the organic insulation film.

In order to repair a line-shortening defect at an intersectional region between a scan line and a signal line, it is very useful to design the line structure to have a branch of at least a scan line or a signal line at the intersectional region and to cut the branch at two regions as to sandwich the shorting defect using a laser beam. When a shorting defect is repaired as described above, the molten material of metal line is scattered in the area of typically 100 μm to 200 μm as shown in Fig. 2, which causes the failure of liquid crystal arrangement as to make a point defect on thin film transistor panel. It is very important to cover the intersectional region containing a shorting defect by using an organic insulating material and to cut the branch before the organic insulating material is cured with a laser beam. In this case, the molten material during the cutting process is trapped inside the organic insulation material with a high viscosity fluid (specification at page 7, paragraphs [40]-[41]; Fig. 3). Thus, the repair for a line-shortening defect can be accomplished with good arrangement of liquid crystal.

In contrast, Choi discloses a method for repairing line-shortening defect. As shown in Fig. 2, a data line 23 is repaired when a short circuit occurs between a scan line 21 and the data line 23 by using the repair pattern (shown as symbol 25). The repair pattern is

bypassed toward pixel electrodes 27, 27a to overlap the pixel electrodes. The data line and the pixel electrode(s) are cut as shown in Fig. 2.

It is clear that the data line in Choi has no branch at the intersectional region between the scan line and the data line. The repair pattern has to be formed in order to avoid the short circuit between a scan line and the data line.

For at least the foregoing reasons, claim 1 and claims 2 and 3 depending therefrom are novel and patentable over Choi.

Applicants respectfully assert that independent claim 4 as amended is novel and patentable over Choi because, for instance, Choi does not disclose or suggest supplying an organic insulating material to cover the intersectional region (between the scan line and the signal line) with a shorting defect locally; severing the scan line at two regions near the stored position of the shorting defect with a laser beam before curing the organic insulation material; and forming an organic insulation film on to the repaired portion. As discussed above, it is very important to cover the intersectional region containing a shorting defect by using an organic insulating material and to cut the branch before the organic insulating material is cured with a laser beam. Choi does not disclose these recited features. Nor does Choi teach to avoid the contamination during the repair process using a coating method of an organic insulation material before the cutting process of the data line.

Claim 6 depends from claim 4, and stands rejected under 35 U.S.C. 103(a) as being unpatentable over Choi in view of Takizawa (JP36315074A). The Examiner cites Takizawa for allegedly disclosing detecting a shorting defect by applying a voltage between the scan line and signal line and locating a source of infrared detector heat produced at the shorting defect for easily and accurately detecting the short-circuit position. Even assuming that the Examiner's statement regarding Takizawa is accurate, it still does not cure the deficiencies of Choi, in that Takizawa also fails to teach or suggest supplying an organic insulating material to cover the intersectional region (between the scan line and the signal line) with a shorting defect locally; severing the scan line at two regions near the stored position of the shorting defect with a laser beam before curing the organic insulation material; and forming an organic insulation film on to the repaired portion, as recited in claim 4. For at least the foregoing reasons, claim 6 is patentable.

Claims 1-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Salisbury (US5303074A) in view of Interrante et al. (US5193732A).

Applicants respectfully submit that independent claim 1 is patentable over Salisbury and Interrante et al. because, for instance, they do not disclose or suggest detecting a shorting defect between a scan line and signal line disposed with an interlayer insulation film therebetween and identifying the location of the shorting defect; forming an organic insulating layer to cover the intersectional region with a shorting defect locally; and cutting the branch at two regions as to sandwich the shorting defect using a laser beam before curing the organic insulation film.

As discussed above, it is very useful to design the line structure to have a branch of at least a scan line or a signal line at the intersectional region and to cut the branch at two regions as to sandwich the shorting defect using a laser beam. Further, it is very important to cover the intersectional region containing a shorting defect by using an organic insulating material and to cut the branch before the organic insulating material is cured with a laser beam. These features are not shown in Salisbury. In contrast, Salisbury merely discloses positioning repair lines 122, 123 so that transmission lines 102, 103 may be severed adjacent to crossover point 118 without severing the associated repair lines (col. 7, lines 56-59). Interrante et al. is cited merely for allegedly disclosing the repair of the defect of a conductive thin film line comprising an insulating layer to cover a region at the location of the shorting defect for protecting coating. It does not cure the deficiencies of Salisbury.

For at least the foregoing reasons, claim 1 and claims 2 and 3 depending therefrom are novel and patentable over Salisbury and Interrante et al.

Applicants respectfully assert that independent claim 4 as amended is novel and patentable over Salisbury and Interrante et al. because, for instance, they do not disclose or suggest supplying an organic insulating material to cover the intersectional region (between the scan line and the signal line) with a shorting defect locally; severing the scan line at two regions near the stored position of the shorting defect with a laser beam before curing the organic insulation material; and forming an organic insulation film on to the repaired portion. As discussed above, it is very important to cover the intersectional region containing a shorting defect by using an organic insulating material and to cut the branch before the organic insulating material is cured with a laser beam. Salisbury and Interrante et

al. do not disclose these recited features. Nor do they teach to avoid the contamination during the repair process using a coating method of an organic insulation material before the cutting process of the data line.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Salisbury and Interrante et al., in view of Takizawa. As discussed above, Takizawa is cited merely for allegedly disclosing detecting a shorting defect by applying a voltage between the scan line and signal line and locating a source of infrared detector heat produced at the shorting defect for easily and accurately detecting the short-circuit position. Even assuming that the Examiner's statement regarding Takizawa is accurate, it still does not cure the deficiencies of Salisbury and Interrante et al. Therefore, for at least the foregoing reasons, claim 6 is patentable.

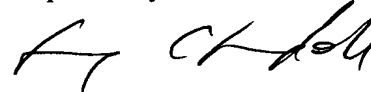
New claim 16 depends from claim 1, and further recites forming an organic insulation film on to the repaired portion. Claim 16 is patentable at least for the same reasons that claim 1 is allowable over the cited art.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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